1. (once amended) A method of providing an iron oxide complex for administration to a mammalian subject, the method consisting of:

producing a carboxyalkylated reduced polysaccharide iron oxide complex; and

sterilizing the complex by autoclaving.

7. (once amended) A method according to claim 1, wherein producing the complex includes carboxyalkylating a reduced polysaccharide by carboxymethylation.

10. (once amended) A method according to claim 1, wherein the carboxyalkylated, reduced polysaccharide isolated as a sodium salt does not contain an infrared absorption peak in the region of about 1650 cm^{-1} to about 1800 cm^{-1}.

11. (once amended) A method according to claim 1, wherein producing the carboxyalkylated reduced polysaccharide is achieved at a temperature of less than about 50 °C.

12. (once amended) A method according to claim 11, wherein producing the carboxyalkylated reduced polysaccharide is achieved at a temperature of less than about 40 °C.

13. (amended) A method according to claim 1, wherein the iron oxide is superparamagnetic.

18. (amended) A reduced polysaccharide iron oxide complex produced according to the method of claim 1, wherein the produced complex is stable at a temperature of at least 100 °C.

19. (once amended) A reduced carboxyalkylated polysaccharide iron oxide complex wherein the produced complex is stable at a temperature of about 121 °C.

20. (once amended) A reduced polysaccharide iron oxide complex according to claim 19, wherein the produced complex is stable at a temperature of at least about 121 °C for a period of time effective to sterilize the complex.

22. (once amended) A reduced polysaccharide iron oxide complex according to claim 20, wherein the carboxyalkylated reduced polysaccharide is selected from the group consisting of a carboxymethyl, carboxyethyl and carboxypropyl reduced polysaccharide.

24. (once amended) A reduced polysaccharide iron oxide complex according to claim 22, wherein the reduced polysaccharide is a reduced dextran.

25. (once amended) A reduced polysaccharide iron complex according to claim 22, wherein the carboxyalkylated reduced dextran is a carboxymethyl reduced dextran.

26. (twice amended) A reduced polysaccharide iron oxide complex according to claim 24, wherein the carboxyalkylated reduced dextran comprises at least about 750 micromole of carboxyl groups per gram of polysaccharide.

27. (twice amended) A reduced polysaccharide iron oxide complex according to claim 26, wherein the carboxyalkylated reduced dextran comprises at least about 900 micromole of carboxyl groups per gram of polysaccharide.

28. (twice amended) A reduced polysaccharide iron oxide complex according to claim 27, wherein the carboxyalkylated reduced dextran comprises at least about 1100 micromole of carboxyl groups per gram of polysaccharide.

29. (twice amended) A reduced polysaccharide iron oxide complex according to claim 28, wherein the carboxyalkylated reduced dextran comprises less than about 1500 micromole of carboxyl groups per gram of polysaccharide wherein said complex does not form substantial particulates.

53. (once amended) A method of providing a contrast agent for in vivo MRI of a subject according to claim 1, consisting of the steps of:

formulating a composition which is a carboxymethylated reduced ultrasmall superparamagnetic iron oxide complex; and

terminally sterilizing the composition by autoclaving.